

(c) cross-linking, via a siloxane bond, at least one silanol group from a first silyl lipid with at least one silanol group from a second silyl lipid.

2. (Amended) A method of preparing an encapsulated Langmuir lipid membrane, the method comprising:

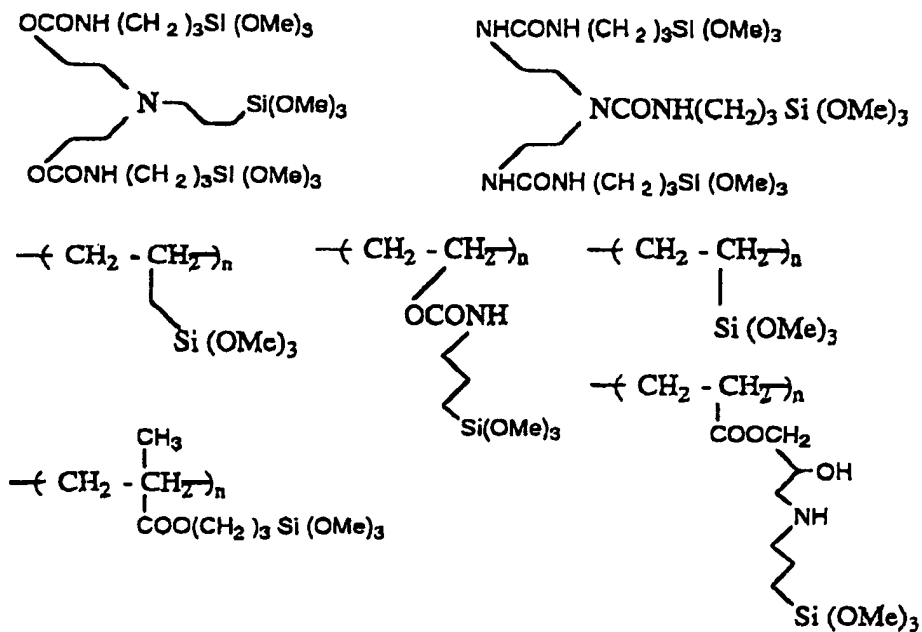
(a) providing a lipid monolayer, bilayer or multilayer membrane comprising a plurality of silyl lipid molecules integrally-associated with the lipid monolayer, bilayer or multilayer membrane, wherein each silyl lipid molecule comprises at least one silanol group;

(b) cross-linking, via a siloxane bond, at least one silanol group from a first silyl lipid with at least one silanol group from a second silyl lipid;

(c) providing an upper layer of encapsulation material;  
and

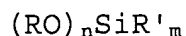
(d) providing a lower layer of encapsulation material or a lower layer of supporting substrate,

wherein the lipid monolayer, bilayer or multilayer membrane is positioned between the upper layer and the lower layer.

$$(\text{MeO})_3\text{Si}(\text{CH}_2)_2\text{Si}(\text{OMe})_3$$
$$(\text{MeO})_3\text{Si}(\text{CH}_2)_3\text{NH}(\text{CH}_2)_2\text{NH}(\text{CH}_2)_3\text{Si}(\text{OMe})_3$$
$$(\text{MeO})_3\text{Si}(\text{CH}_2)_3\text{NHCONH}(\text{CH}_2)_3\text{Si}(\text{OMe})_3$$
$$(\text{MeO})_3\text{Si}(\text{CH}_2)_3\text{NHCOO}(\text{CH}_2\text{CH}_2\text{O})_n\text{CONH}(\text{CH}_2)_3\text{Si}(\text{OMe})_3 \quad n=1,2,3,4$$


4. (Amended) A method of modifying the pH of a fluid comprising plasma and suspended formed elements, the method comprising contacting the fluid with a lipid membrane prepared by the method claim 2, wherein the lipid membrane is associated with an acidic compound capable of modifying the pH of the fluid.

5. (Amended) The method of claim 2 wherein said silyl lipid is of the formula:



wherein:

R is selected from a group consisting of C<sub>1</sub>-C<sub>50</sub> alkyl;

R' is selected from a group consisting of (CH<sub>2</sub>)<sub>q</sub>A and OSiR<sub>3</sub>;

A is selected from a group consisting of hydrogen, COO<sup>-</sup>, OH, COOH, N<sup>+</sup>R<sub>1</sub>R<sub>2</sub>R<sub>3</sub>, NHR'', SH, SR'' and C<sub>1</sub>-C<sub>50</sub> alkyl;

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R'' are selected from a group consisting of (CH<sub>2</sub>)<sub>q</sub>CH<sub>3</sub> and (CH<sub>2</sub>)<sub>q</sub>Si(OR)<sub>3</sub>;

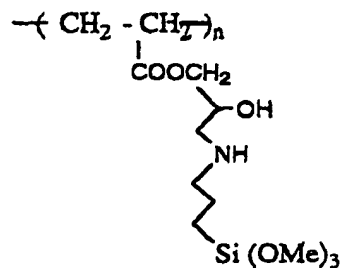
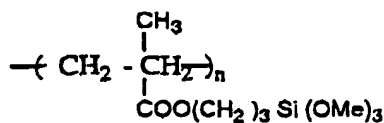
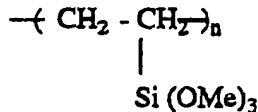
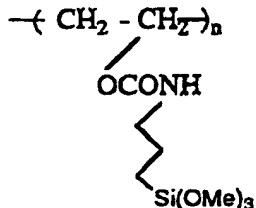
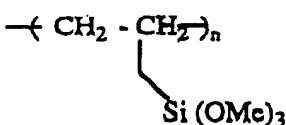
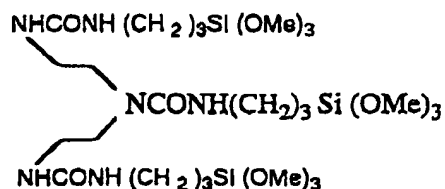
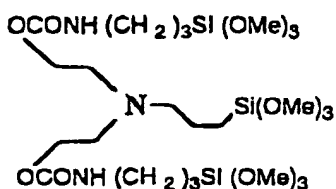
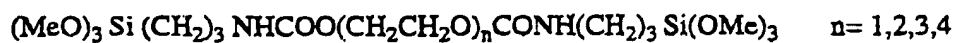
q is a number from 1 to 50;

n is a number from 1 to 4; and

m is a number from zero to 3.

6. (Amended) The method of claim 2 wherein said encapsulation material is an inorganic-organic hybrid mixture sol.

8. (Amended) The method of claim 6 wherein said hybrid mixture sol is prepared from precursor molecules of the following formula:



Please add the following new claims:

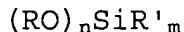
~~9~~-~~10~~. A method for stabilizing a lipid membrane, the method comprising:

- a) providing a lipid membrane comprising a lipid monolayer, bilayer or multilayer;
- b) providing a plurality of silyl lipid molecules integrally-associated with the lipid membrane of a), wherein each silyl lipid molecule comprises at least one silanol group; and
- c) cross-linking, via a siloxane bond, at least one silanol group from a first silyl lipid with at least one silanol group from a second silyl lipid, thereby stabilizing the lipid vesicle.

~~10~~. The method of claim 9, wherein the lipid membrane comprises phospholipids.

~~11~~. The method of claim 9, wherein the lipid membrane further comprises a protein.

~~12.~~ The method of claim 9, wherein the silyl lipid is of the formula:



wherein:

R is selected from a group consisting of C<sub>1</sub>-C<sub>50</sub> alkyl;

R' is selected from a group consisting of (CH<sub>2</sub>)<sub>q</sub>A and OSiR<sub>3</sub>;

A is selected from a group consisting of hydrogen, COO<sup>-</sup>, OH, COOH, N<sup>+</sup>R<sub>1</sub>R<sub>2</sub>R<sub>3</sub>, NHR'', SH, SR'' and C<sub>1</sub>-C<sub>50</sub> alkyl;

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R'' are selected from a group consisting of (CH<sub>2</sub>)<sub>q</sub>CH<sub>3</sub> and (CH<sub>2</sub>)<sub>q</sub>Si(OR)<sub>3</sub>;

q is a number from 1 to 50;

n is a number from 1 to 4; and

m is a number from zero to 3.

~~13.~~ The method of claim 9, wherein the lipid membrane forms a vesicle.

~~14.~~ The method of claim 9, wherein the silyl lipids are further cross-linked to an encapsulation material.

~~15.~~ The method of claim 14, wherein the encapsulation material is selected from the group consisting of sol-gel matrix, hybrid mixture sol-gel matrix and glass matrix.

~~16.~~ The method of claim 14, wherein the sol-gel matrix is an inorganic-organic hybrid mixture sol.

17. The method of claim 15 wherein the hybrid mixture sol-gel matrix is prepared from precursor molecules of the following formula:

